



U.S. NUCLEAR REGULATORY COMMISSION  
**STANDARD REVIEW PLAN**  
OFFICE OF NUCLEAR REACTOR REGULATION

STANDARD REVIEW PLAN (NUREG-0800)  
CHAPTER 13, "CONDUCT OF OPERATIONS"  
SECTION 13.1.1, "MANAGEMENT AND TECHNICAL SUPPORT ORGANIZATION"

**13.1.1 MANAGEMENT AND TECHNICAL SUPPORT ORGANIZATION**

REVIEW RESPONSIBILITIES

Primary - Branch responsible for human performance  
Secondary - None

**I. AREAS OF REVIEW**

The branch with primary responsibility for reviewing human performance will review the corporate level management and technical organization of the applicant for a construction permit (CP), operating license (OL), combined license (COL), or license transfer. The review will include the applicant's major contractors, including the nuclear steam supply system (NSSS) vendor, and architect-engineer (AE) for the project. The technical resources to support the nuclear power plant's design, construction, testing, and operation are reviewed. The review for a CP or COL will include the responsibilities, technical staff, interface arrangements, and management controls used to ensure that the design and construction of the facility will be performed in an acceptable manner. The review for an OL or COL will examine the applicant's corporate organization and the technical staff that will support safe plant operation. The review for license transfer will examine the acceptability of any changes to the technical organization or personnel qualifications proposed as a result of a license transfer under 10 CFR 50.80.

The objective of this review is to ensure that the corporate management is involved with, informed of, and dedicated to the safe design, construction, testing and operation of the nuclear plant. In addition, the review is to ensure that sufficient technical resources have been, are being, and will continue to be provided to adequately accomplish these objectives.

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**USNRC STANDARD REVIEW PLAN**

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, DC 20555.

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**A. Reviews of Initial Construction Permits (CPs), Early-Stage Combined Licenses (COLs), CP and Early-Stage COL Transfers**

The applicant's past experience in the design and construction of nuclear power plants and past experience in activities of similar scope and complexity should be described. The applicant's management, engineering, and technical support organizations should also be described. The description should include organizational charts for the current headquarters and engineering structure and planned modifications and additions to those organizations to reflect the added functional responsibilities associated with the nuclear plant.

**1. Design and Construction Responsibilities**

The following aspects of the implementation or delegation of design and construction responsibilities should be described:

- a. Principal site-related engineering studies of the meteorology, geology, seismology, hydrology, demography, and environmental effects
- b. Design of plant and ancillary systems, including fire protection systems
- c. Review and approval of plant design features, including human factors engineering (HFE) considerations
- d. Site layout with respect to environmental effects and security provisions
- e. Development of safety analysis reports (SARs)
- f. Material and component specification review and approval
- g. Procurement of materials and equipment
- h. Management of construction activities

**2. Preoperational Responsibilities**

A description of the proposed plans for the management organization for the initial test program should include the following:

- a. Development of plans for the preoperational and startup testing of the facility
- b. Development and implementation of staff recruiting and training programs
- c. Development of plant maintenance programs

The descriptions of the design and construction and preoperational responsibilities should include the following:

- a. How these responsibilities are assigned by the headquarters staff and implemented within the organizational units
- b. The responsible working- or performance-level organizational unit
- c. The estimated number of persons to be assigned to each unit with responsibility for the project
- d. The general educational and experience requirements for identified positions or classes of positions
- e. How applicant's management interfaces with the NSSS and AE organizations
- f. Education and experience required for management and supervisory positions
- g. The required review of contractor work by the applicant's staff

- h. For identified positions or classes of positions that have functional responsibilities other than for the CP or COL application, the expected proportion of time assigned to the other activities
- i. Early plans for providing technical support for the operation of the facility

The CP- or COL-stage review of the NSSS and AE organizations includes an evaluation of the ability of the technical staff of each organization to support or perform the activities specified in the application, as applicable. The information submitted should include a description of the activity (including its scope), an organizational description, with charts lines of authority and responsibility for the project, the number of persons assigned to the project, and qualification requirements for principal management positions for the project. For NSSS and AE organizations with extensive experience, a detailed description of this experience may be provided in lieu of the details of their organization as evidence of technical capability. However, the applicant should describe how this experience will be applied to the project.

#### **B. OL and COL**

The SAR should provide the following information:

1. Organizational charts of the applicant's corporate level management and technical support organizations
2. The relationship of the nuclear-oriented part of the organization to the rest of the corporate organization
3. A description of the provisions for technical support for operations
4. The organizational unit and any augmenting organizations, or other personnel, who will manage or execute any phase of the test program, and the responsibilities and authorities of the principal participants

Technical services and backup support for the operating organization should be available before the preoperational and startup testing program begins and continue throughout the life of the plant.

The SAR should (1) give the approximate numbers of and describe educational and experience requirements for, each identified position or class of positions providing technical support for plant operations, and (2) include specific educational and experience requirements for individuals holding the management and supervisory positions in organizational units providing support in the areas identified below:

1. Nuclear, mechanical, structural, electrical, thermal-hydraulic, metallurgical, materials, and instrumentation and controls engineering
2. Plant chemistry
3. Health physics
4. Fueling and refueling operations support
5. Maintenance support
6. Operations support
7. Quality assurance
8. Training
9. Safety review
10. Fire protection
11. Emergency organization
12. Outside contractual assistance

### **C. Reviews of OL Transfers**

An applicant for transfer of an OL should provide a description of the organization to support plant operations. The description should include:

1. Organizational charts of the corporate level management and technical support organizations, emphasizing the changes to be made as a result of the transfer
2. The relationship of the nuclear-oriented parts of the organization to the rest of the corporate organization
3. A description of the specific provisions which have been made for technical support for operations

### **D. Review Interfaces**

The primary human performance review branch performs the following reviews under the standard review plan (SRP) sections indicated:

- Organizational structure and personnel qualifications and experience under SRP Sections 13.1.1 through 13.1.3
- Training of licensed operators under SRP Section 13.2.1
- Organizational provisions for independent reviews and verifications under SRP Section 13.4
- Procedure adequacy under SRP Section 13.5.2
- Use of human factors engineering principles under SRP Section 18.0

The branch with primary responsibility for human performance will coordinate evaluations and reviews by other branches that interface with the overall review of the management and technical-support organizations as follows:

1. With the branch responsible for emergency preparedness and radiation protection, which has primary review responsibility under SRP Section 13.3 for reviewing the emergency organization and primary review responsibilities under SRP Section 12.5 for reviewing the acceptability of the radiation protection organization
2. With the branch responsible for safeguards which has primary responsibility under SRP Section 13.6 for reviewing the applicant's plans and provisions for security, including the security organization
3. With the branch responsible for quality assurance, which has primary responsibility under SRP Chapter 17 for reviewing the quality assurance organization and primary review responsibility under SRP Section 13.4 for reviewing the acceptability of the organization of the independent safety engineering group (ISEG)
4. With the branch responsible for plant systems, which has primary responsibility under SRP Section 9.5.1 for reviewing the fire protection organization.

The referenced SRP sections for these areas give the acceptance criteria the reviews and instructions on applying them.

## **II. ACCEPTANCE CRITERIA**

### **A. General Guidance**

In describing its resources for dealing with safety-related aspects of adding nuclear generating capacity, the applicant should provide contributory evidence of its technical qualifications as required by 10 CFR 50.40(b) and 10 CFR 50.80, as applicable.

In reviewing and evaluating this SAR section, the following points should be considered.

1. The corporate level management and technical support structures should be free of ambiguous assignments of primary responsibility, as demonstrated by organizational charts and descriptions of functions and responsibilities.
2. The corporate officer responsible for nuclear activities should be identified and have no ancillary responsibilities that might detract attention from nuclear safety matters.
3. Design and construction responsibilities should be reasonably well defined in both numbers and experience of persons required to implement the project.
4. Similarly, management and organizational responsibilities should be clearly defined to address human factors engineering (HFE) considerations in human-system interface issues. This subject is covered in more detail in NUREG-0711 and in SRP Chapter 18 (Draft, April 1996).

#### **B. Specific Criteria**

Specific criteria are described below for meeting 10 CFR 50.40(b) with respect to the CP, OL, COL reviews and 10 CFR 50.80 with respect to license transfer reviews.

##### **For Reviewing Initial CP, Early-Stage COLs, CP and Early-Stage COL Transfers**

1. The applicant has identified and functionally described the organizational groups responsible for implementing the project.
2. The applicant has described how it will carry out its responsibilities to consider safety first in designing and construct the project and during the transition to operation and to control major contractors.
3. The organizational units involved in the design and construction of the project communicate fully and frankly among each other and with management, and management clearly and unambiguously controls the project.
4. Manpower with suitable experience is available to implement the project.
5. The applicant has clearly described the role and function of the AE and the NSSS vendor during both design and construction and has demonstrated appropriate control over the project-related activities of the AE and NSSS vendor.
6. The applicant has designated the organizations responsible for the test program, and early plans give reasonable assurance that the designated organizations can collectively provide staff with the skills and experience necessary to develop and conduct the test program.

7. The applicant plans to utilize the plant operating and technical staff in developing and conducting the test program and in reviewing test results.
8. For COL applicants subject to 10 CFR 50.34(f), the applicant has identified plans for the organization and staffing to oversee design and construction of the nuclear facility, in accordance with the guidelines of Item II.J.3.1 of NUREG-0718, as related to the requirements of 10 CFR 50.34(f)(3)(vii). As referenced in SRP Section 18.0 (Draft, April 1996), the review criteria for the human factors engineering (HFE) design team are provided in NUREG-0711, Chapter 2, "Element 1 - HFE Program Management."

Although the requirements of 10 CFR 50.34(f) apply only to the specific applicants listed in that section, OL applicants should include information related to the organizational and management structure responsible for the design and construction of the proposed plant to ensure that the staff has complete and accurate information for its review.

#### For Reviewing OLs and Late-Stage COLs

The review and evaluation of management and technical organizational structure for OL and COL applicants is based on the guidelines of Three Mile Island (TMI) Action Plan Item I.B.1.2, originally described in NUREG-0694. Specific criteria are as follows:

1. The applicant has identified and described the organizational groups responsible for implementing the initial test program and providing technical support for the operation of the facility.
2. The applicant has described how it will carry out its responsibilities to conduct the initial test program, provide sufficient technical support, and safely operate of the facility.
3. The organizational structure provides for integrated management of activities that support the operation and maintenance of the facility.
4. Clear management control and effective lines of authority and communications exist among the organizational units involved in managing, operating, and providing technical support for the facility.
5. Manpower with suitable experience is available to conduct the initial test program and provide technical support for the operation of the facility. The need to add experienced personnel to the corporate structure during the initial years of operation will be determined on case-by-case basis.
6. Qualifications of members of the technical support organization should meet or exceed those endorsed by Regulatory Guide 1.8.
7. The technical staff will be utilized in the initial test program to the maximum extent practicable. Before testing begins, participants in the test program should receive plant-specific training on the administrative controls for the test program. The level of staffing should be adequate in the reviewer's judgment.

#### For Reviewing Transfer of OL and late-stage COL Transfers

Following are criteria for reviewing the management and technical-support organizational structures of license transfer applicants are as follows:

1. The applicant has identified and described the organizations responsible for the technical support for the operation of the facility.
2. The applicant has described how it will obtain the necessary technical support.
3. The organizational structure provides for integrated management of activities that support the operation and maintenance of the facility.
4. There is clear management control of the organizational units involved in operating and providing technical support for the facility, and there are clear lines of authority between management and these groups and effective communications among them and with management.
5. Manpower with sufficient experience is available to provide the technical support for the operation of the facility.
6. The qualifications of members of the technical support organization meet or exceed those endorsed by Regulatory Guide 1.8.

**C. Technical Rationale**

The technical rationale for applying of the above acceptance criteria for reviewing the management and technical-support organizations is discussed in the following paragraphs.

1. Compliance with the relevant requirements of 10 CFR 50.40(b) requires that the applicant be technically qualified to engage in activities associated with the design, construction, and operation of a nuclear power plant, in accordance with the regulations in 10 CFR Part 50. Similarly, 10 CFR 50.80 requires that the applicant for a license transfer be technically qualified to hold the license.

The management and technical support organizations established by the applicant to oversee the design and construction of a nuclear power plant provide valuable insights into the corporate management's understanding of its safety role in the design, construction, operation, and maintenance of the facility. Those insights help determine that an applicant is technically qualified by ensuring that the applicant addressed appropriate considerations in establishing general qualification requirements and staffing levels for all key positions on which the safety of the facility will depend.

Meeting the requirements of 10 CFR 50.40(b) and 10 CFR 50.80, as applicable, provides assurance that the applicant is technically qualified to engage in the proposed activities and has established the necessary management and technical-support organizations to safely operate the proposed facility.

**III. REVIEW PROCEDURES**

Preparation for reviewing the application should include familiarization with the documents listed as references in this SRP section.

Each element of the application information is to be reviewed against this SRP section. The reviewer's judgment during the review is to be based on an inspection of the material presented, on whether items of special safety significance are involved, and on the magnitude and uniqueness of the project. Any

exceptions or alternatives are to be carefully reviewed to ensure that they are clearly defined and that an adequate basis exists for acceptance.

The applicant should identify the applicable version of references, regulatory guides, and codes and standards used. The reviewer should identify the applicable version of references, regulatory guides, and codes and standards used in the review.

In reviewing and evaluating the information related to this section of the management and technical support organization, the following points should be considered:

- A. In the early-construction stage, the applicant's plans for headquarters staffing to provide technical support when operating may not yet be firm. It is acceptable, therefore, if these plans are not fully specific in terms of numbers of people, provided the commitment made is sufficiently firm to ensure the responsibility will be met.
- B. The reviewer must recognize that there are many acceptable ways to define and delegate job responsibilities. Variations in staffing are to be expected between applicants with and without prior experience in nuclear plant design, construction, or operation. The reviewer must be convinced that an applicant has not underestimated the magnitude of the task. The reviewer should be alert to the possibility that excessive workloads may be placed upon too few individuals. Interface arrangements and controls between the applicant and major contractors (NSSS vendors, architect-engineers, constructors) should be examined to ensure that the applicant will be in charge of and responsible for design and construction activities.

If the application involves the addition of more than one unit, the reviewer should ensure that headquarters staffing plans take this fact into account. This is particularly important if additional units are scheduled to come on line at intervals of a year or less, since the shakedown period for the operation of a new plant can be expected to produce quite heavy workloads. In some cases the applicant may plan to bolster the plant staff organization during such periods so that it is necessary to evaluate headquarters staffing plans in conjunction with plant staffing plans.

- C. The reviewer should assess the degree of participation during the design and construction phases by the headquarters group that typically has plant operating responsibility. Interfaces should be examined between this group and groups with project engineering responsibilities.
- D. At the time of this review, if the applicant has had experience in the operation of a previously licensed nuclear power plant, the reviewer may seek independent information about headquarters staffing and qualifications through the appropriate NRC regional office.

The review procedure for this section, therefore, consists of the following:

- 1. An examination of the information submitted to determine that all areas identified above in subsection I, "Areas of Review," have been addressed
- 2. A comparison of the information with the acceptance criteria of subsection II, "Acceptance Criteria"
- 3. A review of information provided by the NRC regional office position statement on the applicant's organizational and administrative commitments made in the SAR, if applicable



4. Verification of the management structure and technical resources by visits to corporate headquarters and the site, if applicable

Based on the foregoing, the reviewer then determines the overall acceptability of the applicant's management and technical-support organization and staffing plans.

For OL and late-stage COL transfer under 10 CFR Part 50, the existing organization was found acceptable for operations as part of the initial licensing review. Therefore, the review in support of a license transfer should focus on the organizational changes proposed as a result of the transfer. The reviewer should ensure that the proposed changes will result in an organization that will continue to meet the relevant review criteria.

For standard design certification under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3 (Draft, April 1996), to verify that the design set forth in the standard SAR, including inspections, tests, analysis, and acceptance criteria (ITAAC), site interface requirements, and COL action items, meet the acceptance criteria given in subsection II. SRP Section 14.3 (Draft, April 1996) contains procedures for the review of certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.

#### **IV. EVALUATION FINDINGS**

The reviewer verifies that the information presented supports conclusions of the following type in the staff's safety evaluation report:

The staff concludes that the management and technical support organizations are acceptable and meet the requirements of 10 CFR 50.40 and 50.80, as applicable. This conclusion is based on the following:

**A. For a Safety Evaluation Report for an Initial CP or COL or for a Transfer of CP or COL**

The applicant has described clear responsibilities and definite resources for the design and construction of the facility and has described its plans for managing the project and utilizing the NSSS vendor and AE. These plans have been reviewed and give adequate assurance that an acceptable organization has been established and that sufficient resources are available to satisfy the applicant's commitments for the design and construction of the facility. These findings contribute to the judgment that the applicant complies with the requirements of 10 CFR 50.40(b) and 10 CFR 50.80, as applicable; that is, the applicant is technically qualified to engage in design and construction activities.

**B. For a Safety Evaluation Report for an Initial OL or Late-Stage COL**

The applicant has described its organization for the management of, and its means of providing, technical support for the plant staff during operation of the facility. These measures have been reviewed and it is concluded that the applicant has an acceptable organization and adequate resources to provide offsite technical support for the operation of the facility under both normal and off-normal conditions.

**C. For a Safety Evaluation Report for an OL or a Late-Stage COL Transfer**

The applicant has described its organization for managing and its means of providing, technical support to the plant staff for operation of the facility after the license transfer. These measures have been reviewed and it is concluded that the applicant has an acceptable organization and adequate resources to provide offsite technical support for the operation of the facility under both normal and off-normal conditions.

**D. For Design Certification**

For design certification reviews, if the review is not discussed in other safety evaluation report sections, the findings will also summarize the staff's evaluation of inspections, tests, analyses, and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and COL action items that are relevant to this SRP section.

In addition to the finding based on the type of application, the safety evaluation report should also state the following:

These findings contribute to the judgment that the applicant complies with the requirements of 10 CFR 50.40(b) and 10 CFR 50.80, as applicable. That is, the applicant is technically qualified to operate a nuclear power plant; and that the applicant will have the necessary managerial and technical resources to support the plant staff in the event of an emergency; and that the applicant has identified the organizational positions responsible for fire protection matters and delegated the authorities to these positions to implement fire protection requirements.

**V. IMPLEMENTATION**

The following is intended as guidance to applicants and licensees on the NRC staff's plans for using this SRP section.

The NRC staff will use this SRP section in performing safety evaluations of license applications submitted by applicants pursuant to 10 CFR Parts 50 or 52 and for transfer of a license pursuant to 10 CFR 50.80. Except in cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in evaluating conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed 6 months or more after the date of issuance of this SRP section.

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulatory guides and NUREGs.

**VI. REFERENCES**

1. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."
2. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants."
3. Regulatory Guide 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants."
4. NUREG-0694, "TMI-Related Requirements for New Operating Licenses."
5. NUREG-0711, "Human Factors Engineering Program Review Model."
6. NUREG-0718, "Licensing Requirements for Pending Applications for Construction Permits and Manufacturing License."

**7. NUREG-0737, "Clarification of TMI Action Plan Requirements."**

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SAME AS ABOVE

10. SUPPLEMENTARY NOTES

THIS IS A REVISION TO EXISTING GUIDANCE CONTAINED IN THE APRIL, 1996 DRAFT SRP (NUREG-0800)

11. ABSTRACT (200 words or less)

This is a revision to existing guidance as contained in NUREG-0800, Draft Revision 3, April, 1996. Chapter 13, "Conduct of Operations," Section 13.1.1, "Management and Technical Support Organization," and Section 13.1.2-13.1.3, "Operating Organization," were revised to include guidance for the staff to use in reviewing applications for license transfer in accordance with 10 CFR 50.80, "Transfer of Licenses."

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